

REMARKS

Claims 1 and 3-19 are in this application and are presented for consideration. By this Amendment, Applicant has amended claims 1 and 17. Claims 8-13 have been canceled. Applicant has also attached an English translation of JP S63-66054.

Claims 8, 9 and 17 have been objected to because of minor informalities.

Claims 8 and 9 have been canceled. Applicant has amended claim 17 to address this issue. Applicant wishes to thank the Examiner for the careful review of the claims.

Claim 1 has been rejected under 35 U.S.C. 103(a) as being unpatentable over JP S63-66054 ("JP '054" hereinafter), and further in view of Uchino et al. (JP 11252869 A) and Mabuchi (U.S. 4,574,215).

The present invention relates to a brush holder device that is used in motors. The brush holder device includes a holder and a brush arm. Both the holder and the brush arm have brush holder contact portions. Each brush contact portion of the brush arm is located at an edge that defines the engagement hole of the brush arm. Each brush contact portion of the holder is located at an edge that defines the engagement hole of the holder. The engagement hole of the holder is aligned with the engagement hole of the brush arm when the holder is connected to the brush arm. The brush contact portions of the brush arm extend through the engagement hole of the holder so that each brush contact portion of the brush arm is next to one of the brush contact portions of the holder when the brush arm is connected to the holder. The brush contact portions of the holder and the brush arm engage each side of the engagement portion of the brush so that the brush is connected to the brush arm and the holder. The connection of

the brush arm to the holder is significant in the present invention because it advantageously enhances the strength, rigidity and durability of the holder. This connection advantageously prevents torsion of a brush-holding portion of the brush arm. This advantageously provides a brush holder device that has a longer service life. Further, the brush contact portions of the brush arm and the holder advantageously provide for better heat radiating characteristics than conventional techniques. The prior art as a whole fails to disclose such features or advantages.

JP '054 discloses a brush arm 1 that is fixedly place, while the carbon brush 13 is moved upward to have a stepped head portion thereof inserted into the brush insertion hole 2 of the brush arm 1. The fixing plate 7 is moved downward for press fitting to the stepped head portion of the carbon brush 13. The fixing plate 7 is further moved downward for press fitting to the stepped head portion of the carbon bush 13. Thus the bent portions 11 and 12 of the spring member structuring the fixing plate 7 can press and secure, from inside, the bent portions 3 and 4, respectively, of the brush arm 1. In this case, the insides of the brush-pressing portions 9 and 10 of the fixing plate 7 clamp and secure the respective side faces of the stepped head portion of the carbon bush 13. The projections 5 and 6 provided at the brush arm 1 then dig into the carbon brush 13 to ensure fixation and electric conductivity.

Uchino et al. discloses a brush holder device 1 having first and second planar pressure pieces 2g, 2h arranged in the direction of revolution of a commutator. The first and second planar pressure pieces 2g, 2h are capable of being brought into planar contact with the brush holder attaching portion of a brush 10. Third and fourth planar pressure pieces 2i, 2j are placed in a direction orthogonal to the direction of the revolution of the commutator. The third and

fourth planar pressure pieces 2i, 2j are capable of being brought into planar contact with the brush holder attaching portion 10c of the brush 10. First and second linear pressure pieces 2n, 2p are placed in the direction orthogonal to the direction of revolution of the commutator. The first and second linear pressure pieces 2n, 2p are capable of being brought into linear contact with the brush holder attaching portion 10c of the brush 10.

JP '054 and Uchino et al. fail to provide any teaching or suggestion that would direct the person of ordinary skill in the art toward the combination of brush arm contact portions located at laterally opposite edges of an engagement hole. At most, JP '054 discloses a brush arm 1 having bent portions 3 and 4 that do not contact the engagement portion of the brush 13. Figures 3 and 5 of JP '054 clearly show that a space exists between the engagement portion of the brush 13 and the brush arm 1. The Office Action takes the position that it would have been obvious to have the brush arm brush contact portions extending through the engagement hole of the holder and also to have the holder brush contact portions located on opposite edges in the longitudinal direction since Uchino et al. already discloses brush contact portions on opposite edges in the longitudinal direction. However, the references as a whole fail to provide any suggestion that would direct the person of ordinary skill in the art of using the teachings of Uchino et al. to modify the brush holder of JP '054. JP '054 teaches that it is crucial that the brush-pressing 9 and 10 of the fixing plate 7 are parallel with bent portions 11, 12 of the fixing plate 7 as well as bent portions 3, 4 of the brush arm 1 since the parallel brush-pressing portions 9, 10 and bent portions 11, 12 of the fixing plate 7 are inserted between the bent portions 3, 4 of the brush arm 1 and side walls of the brush 13 to press-fit the brush 13 against the brush arm

1 via the resiliency of the fixing plate 7 (page 4, line 27 through page 5, line 10 of English translation). The brush-pressing portions 9, 10 of JP '054 could not properly engage the brush 13 if the portions 9, 10 were formed along opposite edges in a longitudinal direction of the brush arm 1 as claimed. As such, the references as a whole do not direct the person of ordinary skill in the art toward the combination of brush arm contact portions located at laterally opposite edges of the engagement hole as claimed. Accordingly, Applicant respectfully requests that the Examiner favorably consider claim 1 as presented and all claims that depend thereon.

Claim 3 has been rejected under 35 U.S.C. 103(a) as being unpatentable over JP '054 and Uchino et al. and Mabuchi, and further in view of Yoshida (U.S. 4,238,703). Although Yoshida teaches a brush device having a brush fitting section having a pair of brush holding flaps which are mutually opposed along a lengthwise direction of the holder, the references as a whole fail to suggest the combination of features claimed. Specifically, JP '054 and Uchino et al. provide no teaching or suggestion for the combination of brush contact portions formed on opposite edges in a longitudinal direction of a brush arm. The references together do not suggest the combination of features claimed. One of ordinary skill in the art is presented with various concepts, but these concepts do not provide any direction as to combining the features claimed. All claims define over the prior art as a whole.

Claims 4, 6, 14, 18 and 19 have been rejected under 35 U.S.C. 103(a) as being unpatentable over JP '054, and further in view of Uchino et al.

JP '054 and Uchino et al. fail to teach or suggest the combination of holder brush

contact portions formed on opposite edges in a longitudinal direction of a brush arm, wherein the brush contact portions of the brush arm have a length corresponding to a longitudinal length of the brush receiving hole of the holder. JP '054 and Uchino et al. merely disclose brush arms, but the references as a whole fail to provide any suggestion of a brush contact portion that extends through a receiving hole of a holder such that the holder and the brush arm are connected to a brush. The Office Action states that it would have been obvious to have the brush contact portions extending through the engagement hole of the holder since Uchino et al. shows brush contact portions extending upward on the brush arm and that a person of ordinary skill could combine this with the holder of JP '054 so that these brush contact portions of the brush arm can extend through the engagement hole of the holder. Applicant respectfully disagrees since it is impossible in JP '054 to orient the holder brush contact portion in the longitudinal direction. JP '054 clearly discloses that it is necessary that the brush-pressing portions 9, 10 of the fixing plate 7 are parallel with bent portions 11, 12 of the fixing plate 7 as well as bent portions 3, 4 of the brush arm 1 (page 3, line 27 through page 4, line 8 of translation). The paralleled brush-pressing portions 9, 10 of JP '054 and bent portions 11, 12 of the fixing plate 7 are inserted between the bent portions 3, 4 of the brush arm 1 and side walls of the brush 13 (see Figure 3) to press-fit the brush 13 against the brush arm 1 by the resiliency of the fixing plate 7 (page 4, lines 4-8 of translation). As such, the brush-pressing portions 9, 10 could not function if the portions 9, 10 are formed along the opposite edges in a longitudinal direction of the brush arm 1 since portions 9, 10 would no longer be press-fitted against the brush 13. As such, the combination of JP '054 and Uchino et al. does not lead the

person of ordinary skill in the art toward a brush arm and a holder having brush contact portions formed on opposite edges in a longitudinal direction of a brush arm as claimed. Accordingly, Applicant respectfully requests that the Examiner favorably consider claims 4 and 6 as now presented and all claims that respectively depend thereon.

Claims 5 and 7 have been rejected under 35 U.S.C. 103(a) as being unpatentable over JP '054 and Uchino et al., and further in view of Yoshida. Although Yoshida teaches a brush device having a brush fitting section having a pair of brush holding flaps which are mutually opposed along a lengthwise direction of the holder, the references as a whole fail to suggest the combination of features claimed. Specifically, JP '054 and Uchino et al. provide no teaching for the combination of brush contact portions formed on opposite edges in a longitudinal direction of a brush arm. The references together do not suggest the combination of features claimed. One of ordinary skill in the art is presented with various concepts, but these concepts do not provide any direction as to combining the features claimed. All claims define over the prior art as a whole.

Claims 15-17 have been rejected under 35 U.S.C. 103(a) as being unpatentable over JP '054 and Uchino et al., and further in view of Mabuchi. As previously discussed above, the references as a whole fail to provide any suggestion of using the teaching of Uchino et al. to modify the holder of JP '054. As such, all claims define over the prior art as a whole.

Claims 8-10 and 12 have been rejected under 35 U.S.C. 103(a) as being unpatentable over JP '054, and further in view of Mabuchi. Claims 11 and 13 have been rejected under 35 U.S.C. 103(a) as being unpatentable over JP '054 and Mabuchi, and further in view of Yoshida.

Applicant has canceled claims 8-11 and 13.

Favorable consideration on the merits is requested.

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Attached: English Translation of JP S63-66054

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